Radicals are fractional exponents

$\frac{\text{power}}{\text{root}}$

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Mr. Schlansky Algebra II

$\sqrt[?]{x^1}$

$\text{root}\sqrt{\text{power}}$

Fractional Exponents

Rewrite the following as radicals

1. $x^{\frac{2}{3}}$ $\frac{p}{r}$

$\sqrt[3]{x^2}$

2. $x^{\frac{3}{4}}$ $\frac{p}{r}$

$\sqrt[4]{x^3}$

3. $x^{\frac{5}{6}}$ $\frac{p}{r}$

$\sqrt[6]{x^5}$

4. $x^{\frac{1}{3}}$ $\frac{p}{r}$

$\sqrt[3]{x}$

5. $x^{\frac{3}{2}}$ $\frac{p}{r}$

$\sqrt{x^3}$

6. $x^{\frac{1}{2}}$ $\frac{p}{r}$

$\sqrt{x}$

7. $x^{\frac{4}{5}}$ $\frac{p}{r}$

$\sqrt[5]{x^4}$

8. $x^{\frac{1}{7}}$ $\frac{p}{r}$

$\sqrt[7]{x}$

9. $x^{\frac{5}{2}}$ $\frac{p}{r}$

$\sqrt{x^5}$

Rewrite the following using fractional exponents

10. $\sqrt[3]{x^4}$

$x^{\frac{4}{3}}$

11. $\sqrt[5]{x^3}$

$x^{\frac{3}{5}}$

12. $\sqrt[4]{x^7}$

$x^{\frac{7}{4}}$

13. $\sqrt[2]{x^3}$

$x^{\frac{3}{2}}$

14. $\sqrt[6]{x^5}$

$x^{\frac{5}{6}}$

15. $\sqrt[2]{x^1}$

$x^{\frac{1}{2}}$

16. $\sqrt[8]{x^3}$

$x^{\frac{3}{8}}$

17. $\sqrt[5]{x^3}$

$x^{\frac{3}{5}}$

18. $\sqrt[3]{x^1}$

$x^{\frac{1}{3}}$

Evaluate each of the following:

19. $25^{\frac{1}{2}}$

$(\sqrt[2]{25})^1$

$5^1 = 5$

20. $8^{\frac{1}{3}}$

$(\sqrt[3]{8})^1 \rightarrow 2^1 = 2$

21. $100^{\frac{1}{2}}$

$(\sqrt[2]{100})^1 \rightarrow 10^1 = 10$

22. $4^{\frac{3}{2}}$

$(\sqrt[2]{4})^3 \quad 2^3 = 8$

23. $27^{\frac{2}{3}}$

$(\sqrt[3]{27})^2$

$3^2 = 9$

24. $125^{\frac{5}{3}}$

$(\sqrt[3]{125})^5$

$5^5 = 3125$

25. $8^{\frac{5}{3}}$

$(\sqrt[3]{8})^5 \quad 2^5 = 32$

26. $81^{\frac{3}{4}}$

$(\sqrt[4]{81})^3 \quad 3^3 = 27$

27. $16^{\frac{3}{2}}$

$(\sqrt[2]{16})^3 \quad 4^3 = 64$

28. $16^{\frac{5}{4}}$

$(\sqrt[4]{16})^5 \quad 2^5 = 32$

29. $36^{\frac{3}{2}}$

$(\sqrt[2]{36})^3 \quad 6^3 = 216$

30. $32^{\frac{2}{5}}$

$(\sqrt[5]{32})^2 \quad 2^2 = 4$

31. Explain what a rational exponent, such as $\frac{5}{2}$ means. Use this explanation to evaluate $9^{\frac{5}{2}}$.

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$(\sqrt[2]{9})^5$

$3^5 = 243$

32. Explain how $125^{\frac{4}{3}}$ can be evaluated using properties of rational exponents to result in an integer answer.

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$(\sqrt[3]{125})^4$

$5^4 = 625$

33. Explain how $(-8)^{\frac{4}{3}}$ can be evaluated using properties of rational exponents to result in an integer answer.

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$(\sqrt[3]{-8})^4$

$(-2)^4 = 16$